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Electronic Submittal

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**Joint Application for PSCW Certificate of Public Convenience and Necessity and
WDNR Utility Permit Badger Coulee 345 kV Transmission Line Project
PSCW Docket No. 5-CE-142**

Part 1 of the Applicants' Responses to PSCW Staff's Fourth Set of Data Requests

Dear Mssrs. Lepinski and Siebert:

Attached please find Part 1 of the Applicants', American Transmission Company LLC by its corporate manager ATC Management Inc. (collectively ATC) and Northern States Power Company (NSPW), responses to your fourth set of data requests dated May 22, 2014 in the above referenced docket. Part 1 contains responses to 4.01, 4.03, 4.05, 4.07, 4.08, 4.10, 4.11 and 4.12. Any attachments to the responses have at the beginning of their name the item number that it corresponds with and then are consecutively numbered. All acronyms and abbreviations used in these responses correspond with the list on pages ix and x of the Joint Application.

Please contact us if you have any questions.

Sincerely,

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**Badger Coulee 345 kV Transmission Line Project
Docket No. 5-CE-142**

**PSCW Fourth Set of Request Items
Request No. 04.01 Response**

REQUEST NO. 04.01:

(Response to item 01.145) Confirm that the historical coincident peak load for NSPW was 1,387 MW for both 2006 and 2007.

RESPONSE TO REQUEST NO. 04.01:

Confirmed. The coincident peak for NSPW was 1,387 MW for both 2006 and 2007.

Dated this 23rd day of June, 2014.

**Badger Coulee 345 kV Transmission Line Project
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**PSCW Fourth Set of Request Items
Request No. 04.03 Response**

REQUEST NO. 04.03:

(Responses to items 01.145 and 01.146.) The historical average annual peak load growth from 2001-2013 for DPCW was 2.43 percent (response to item 1.145). Explain why the 2023 forecast for DPCW results in an average annual growth rate of only 0.44 percent (response to item 1.146).

RESPONSE TO REQUEST NO. 04.03:

To calculate a 0.44 percent annual growth rate based on the 2012 Load Forecast requires use of the 2013 peak as the starting point for this calculation. However, the 2012 Load Forecast uses the 2011 peak as a starting point due to the available load data when this 2012 Load Forecast was created. If the 2011 non-weather normalized peak load data was used as a starting point to calculate an average annual growth rate, this would result in an average annual growth rate of 1.03 percent, close to the 1.1 percent annual growth rate used in DPC's 2012 Load Forecast. The difference between 1.03 percent and 1.1 percent exists because DPC does not uniformly grow the DPC load across the DPC footprint.

As stated in response to request 3.01, DPC's coincident summer peak loads experienced a large increase in 2011 (66 MW increase from 2010) and in 2012 (44 MW increase from 2011). While 2013 peak loads dropped slightly from 2012 peak loads, these loads were higher than 2011 and all years prior to 2011. These high peak loads for these three years contribute to a high average annual peak load growth for these historical peak loads.

Dated this 23rd day of June, 2014.

**Badger Coulee 345 kV Transmission Line Project
Docket No. 5-CE-142**

**PSCW Fourth Set of Request Items
Request No. 04.05 Response**

REQUEST NO. 04.05:

(Application Appendix D, paged 122-24). Provide AutoCad- or ArcGIS compatible versions of Figures I, II, and III. Provide these versions in a vector format, not a raster format.

RESPONSE TO REQUEST NO. 04.05:

Pursuant to discussions with the PSCW staff, the Applicants in Attachment 04.05-1 are providing these figures in PDF format.

Dated this 23rd day of June, 2014.

Badger Coulee 345 kV Transmission Line Project
Docket No. 5-CE-142

PSCW Fourth Set of Request Items
Request No. 04.07 Response

REQUEST NO. 04.07:

Many modern agricultural machines have highly sensitive control systems used to optimize various agricultural operations. Discuss the potential for the proposed project causing the malfunction of these systems and describe any available methods to mitigate such malfunctions.

RESPONSE TO REQUEST NO. 04.07:

Electric currents can be induced in conductive objects near transmission lines due to magnetic or electric fields. An object's characteristics, degree of grounding, and electric field strength affect the amount of charge induced. Very long stationary objects and metallic agricultural equipment located close to transmission lines can obtain induced electric currents. Metallic roofs, vehicles, vineyard trellises, and fences are also examples of objects that can develop a small electric charge in proximity to high voltage transmission lines.

Higher frequency harmonic currents are known to be a cause of interference to global positioning satellite (GPS) devices, which are also used for farm applications. However, it is not likely that the proposed 345 kV transmission line would affect a GPS device. This is because transmission line power flows are balanced systems that are comprised of very small harmonic currents, unlike distribution lines, which vary with changing load. Also, having new and existing circuits installed together on a common structure will create a cancelling effect to further reduce EMF. Thus, these lines are not expected to be a source of interference to GPS devices. In general, electronic equipment that is sensitive to magnetic fields typically has shielding and is installed in a protected environment, which significantly reduces the effects of electric and magnetic field interference.

To minimize the effects of electric and magnetic fields on agricultural operations, the Applicants will ensure that the height of the transmission line is sufficient to reduce induction effects to within National Electrical Safety Code (NESC) compliance limits. In addition, as discussed above, the Applicants will optimize the phasing on multi-circuit lines to help reduce EMF, and the Applicants will also provide grounding of fences and metal buildings if calculations show the induced voltage and current may be a concern. On an electric fence, if necessary, a filter will also be installed to drain the 60 Hertz contribution from the transmission line to protect livestock.

Dated this 23rd day of June, 2014.

**Badger Coulee 345 kV Transmission Line Project
Docket No. 5-CE-142**

**PSCW Fourth Set of Request Items
Request No. 04.08 Response**

REQUEST NO. 04.08:

Discuss the potential visual and audible effects of corona discharge from operation of the proposed transmission line and to what distance the effects would be observable. Describe any mitigation measures that could be used to reduce potential effects from corona discharge.

RESPONSE TO REQUEST NO. 04.08:

Corona discharges from a high-voltage transmission line characteristically make a hissing sound, which primarily occurs in wet weather conditions such as rain. This is because corona discharges occur if the perturbed voltage gradient exceeds the corona inception threshold voltage, and the corona onset voltage under dry conditions occurs at a higher voltage than the maximum operating voltage.

The voltage gradients of transmission line conductors can be perturbed by surface imperfections such as water drops, insects, and small imperfections on the surface of the conductor that may occur during construction. These imperfections typically disappear in the first year after energizing the line. Moreover, corona is generally not visually observable for 345 kV transmission line voltages without special camera equipment.

For a residence located approximately 75 feet from the centerline of a double-circuit 345/69 kV line, the Applicants expect that the audible noise level during wet weather conditions will be at approximately the same level as is typical of conversational speech or a typical business office environment.

Dated this 23rd day of June, 2014.

**Badger Coulee 345 kV Transmission Line Project
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**PSCW Fourth Set of Request Items
Request No. 04.10 Response**

REQUEST NO. 04.10:

In the Department of Natural Resources-approved ER Review, the Karner Blue Federal High Potential Range identifies a number of required surveys and coordination with the U.S. Fish and Wildlife Service. However, in Table 3 of Appendix J, Exhibit 1, the Karner Blue Butterfly (KBB) follow-up action is listed as recommended and not required. Explain this apparent discrepancy.

RESPONSE TO REQUEST NO. 04.10:

All Karner Blue Butterfly (KBB) element occurrences and KBB suitable habitat within the Karner Blue Federal High Potential Range have required follow-up actions, as summarized in the text of the Certified Endangered Resources (ER) Review on pages 14-15 and 20. However, as explained in the WDNR Natural Heritage Inventory (NHI) KBB Screening Guidance Document (Attachment 04.10-1), KBB element occurrences outside of the Federal High Potential Range do not require take avoidance (i.e. incidental take is allowed outside of the Federal High Potential Range under the KBB Habitat Conservation Plan). Therefore, in accordance with the WDNR guidance document mentioned above, KBB element occurrences outside of the Federal High Potential Range fall into the recommended voluntary follow-up action category.

To clarify, the follow-up actions for the KBB species occurrence entry in Table 3 of Appendix J, Exhibit 1 are better described as “Required within the Karner Blue High Potential Range” and “Recommended outside of the Karner Blue Federal High Potential Range.”

Dated this 23rd day of June, 2014.

**Badger Coulee 345 kV Transmission Line Project
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**PSCW Fourth Set of Request Items
Request No. 04.11 Response**

REQUEST NO. 04.11:

If the KBB is likely to be present within the approved route, identify the various KBB Construction Guidelines the applicants would follow due to its status as a Wisconsin KBB Habitat Conservation Plan partner.

RESPONSE TO REQUEST NO. 04.11:

As partners to the Karner Blue Butterfly (KBB) Habitat Conservation Plan (HCP), the Applicants will follow the KBB HCP Construction Management Guidelines (Attachment 04.11-1) and Corridor Management Guidelines (Attachment 04.11-2). These guidelines, as well as supporting management protocols, are available at the following Wisconsin Department of Natural Resources' website:

<http://dnr.wi.gov/topic/ForestPlanning/hcpGuide.html>

Dated this 23rd day of June, 2014.

**Badger Coulee 345 kV Transmission Line Project
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PSCW Fourth Set of Request Items

REQUEST NO. 04.12:

Provide any formal correspondence between the applicants and the Natural Resources Conservation Services (NRCS) regarding the three parcels with NRCS easements crossed by Segments I and O. If the Commission should approve a segment which crosses an NRCS easement, discuss the likelihood that NRCS would approve the construction of the transmission line on its easements and what alternative routes may be necessary if NRCS does not grant its approval.

RESPONSE TO REQUEST NO. 04.12:

As described in Section 6.2, page 92 of the Joint Application and in Incompleteness Response 01.54, there are three Natural Resource Conservation Service (NRCS) easements that are crossed by the Southern Route. Sub-segment O24 follows an existing transmission line across a Wetland Reserve Program (WRP) property in the Town of Summit in Juneau County, and Segment I crosses two NRCS easements in Columbia County: an Emergency Watershed Protection Program-Floodplain easement in the Town of Lewiston along the interstate (sub-segment I13) and a WRP easement in Lewiston along an existing transmission line (sub-segment I5). NRCS easement sub-segments O24, I5, and I13 are shown on Attachments 4.12-1, 4.12-2, and 4.12-3, respectively.

Properties with NRCS easements are crossed by Project routes because they occur along existing transmission line and transportation corridors and, generally, are not easily avoided without additional environmental impacts and costs due to additional length and structures. To avoid the WRP easement on sub-segment O24, the ROW would need to be moved farther north of the existing transmission line onto the adjacent property. To avoid the WRP easement on sub-segment I5, the ROW would need to be shifted south, away from the railroad and transmission line corridor, and around the WRP easement. This portion of the route would be cross-country resulting in additional impacts to wetlands, forested areas (including forested wetlands) and agricultural land. The floodplain easement on segment I13 is east of the interstate where the Project follows the interstate corridor. The floodplain easement would be difficult to avoid due to DOT requirements for sharing road ROW and space available between the road and the floodplain easement. To avoid this easement, the Project ROW would need to move east of the interstate for at least two miles (approx.) around the WRP easement before it

returned to the interstate. This would be a cross country route impacting wetlands, waterways, agricultural land, residences, and landowners that are not currently directly impacted by the Project.

To date, there has been no written correspondence between the Applicants and the NRCS regarding these three proposed easement crossings; however, the Applicants have had various discussions with the agency regarding the Project and its potential impacts to the NRCS easements. During these preliminary discussions, NRCS has indicated that, although the agency's preference would be that the Project avoid these easements, there is an established process to modify the easements for utility ROW.

Because the Applicants have no reason at this time to believe that the NRCS will not agree to modify their easements to allow these three crossings pursuant to the agency's established process, the Applicants are not proposing re-route alternatives to avoid the NRCS easements at this time. Nonetheless, the Applicants will continue to discuss these easement crossings with NRCS and will notify the Commission should circumstances change.

Dated this 23rd day of June, 2014.